

WHAT IS CLAIMED IS:

1. A crankshaft bearing comprising:

a cylinder block which constitutes an internal combustion engine, and

5 which includes plural first concave portions on a side opposite to a side where a cylinder head is provided;

10 a cap including plural second concave portions each of which is formed at a position facing each of the first concave portions of the cylinder block such that one predetermined space is formed between each of the plural first concave portions and each of the plural second concave portions when the cap is fitted to the cylinder block; and

15 plural bearing metals including plural upper metals and plural lower metals, each of the upper metals being fitted to each of the plural first concave portions, each of the lower metals being fitted to each of the plural second concave portions, and each of the upper metals and each of the lower metals being combined so as to form an opening portion having a cross section in a substantially circular shape,

20 wherein axes passing through centers of the predetermined spaces are concentric before the cylinder head and a cylinder head gasket are mounted on the cylinder block,

25 wherein an axis passing through a center of at least one of the predetermined spaces is deviated from a given reference straight line in a direction orthogonal to the reference straight line due to elastic bending deformation of the cylinder block when the cylinder head and the cylinder head gasket are mounted on the cylinder block, and

30 wherein a thickness, in a direction parallel to the direction in which the axis is deviated, of one of the upper metal and the lower metal, which is positioned in the same direction as the direction in which the axis is deviated, is increased by an amount by which the axis is deviated from the reference straight line, and a thickness, in the direction parallel to the direction in which the axis is deviated, of one of the

upper metal and the lower metal, which is positioned in a direction opposite to the direction in which the axis is deviated, is reduced by an amount by which the axis is deviated from the reference straight line.

5 2. The crankshaft bearing according to claim 1, wherein the reference straight line is provided so as to match the axis passing through the center of at least one of the predetermined spaces.

10 3. The crankshaft bearing according to claim 2, wherein:
the bearing metals include first bearing metals and a second bearing metal;

the first bearing metals are fitted to the spaces that are formed by the first concave portions and the second concave portions at positions that are closest to both ends of the crankshaft;

15 the second bearing metal is fitted to the space that is formed by the first concave portion and the second concave portion at a position between the positions at which the first bearing metals are provided;

the reference straight line is provided so as to pass through centers of the spaces to which the first bearing metals are fitted;

20 a thickness of one of the upper metal and the lower metal of the second bearing metal, which is positioned in the same direction as the direction in which the axis is deviated from the reference straight line, is increased by an amount by which the axis is deviated from the reference straight line; and

25 a thickness of the other of the upper metal and the lower metal of the second bearing metal, is reduced by the amount by which the axis is deviated from the reference straight line.

30 4. The crankshaft bearing according to claim 2, wherein:
the bearing metals include first bearing metals and a second bearing metal;

the first bearing metals are fitted to the spaces that are formed by the first concave portions and the second concave portions at positions that are closest to both ends of the crankshaft;

5 the second bearing metal is fitted to the space that is formed by the first concave portion and the second concave portion at a position between the positions at which the first bearing metals are provided;

the reference straight line is provided so as to pass through a center of the space to which the second bearing metal is fitted;

10 a thickness of one of the upper metal and the lower metal of each of the first bearing metals, which is positioned in the same direction as the direction in which the axis is deviated from the reference straight line, is increased by an amount by which the axis is deviated from the reference straight line; and

15 a thickness of the other of the upper metal and the lower metal of each of the first bearing metals, is reduced by the amount by which the axis is deviated from the reference straight line.

5. The crankshaft bearing according to claim 1, wherein the reference straight line is provided so as to be apart from the axes passing through the centers of the predetermined spaces to which the bearing metals are fitted.

20

6. The crankshaft bearing according to claim 1, wherein:

the bearing metals include first bearing metals and a second bearing metal; the first bearing metals are fitted to the spaces that are formed by the first concave portions and the second concave portions at positions that are closest to both 25 ends of the crankshaft;

the second bearing metal is fitted to the space that is formed by the first concave portion and the second concave portion at a position between the positions at which the first bearing metals are provided; and

30 the reference straight line is provided such that a distance between the reference straight line and an axis passing through centers of the first bearing metals is

equal to a distance between the reference straight line and an axis passing through a center of the second bearing metal.

5 7. The crankshaft bearing according to claim 1, wherein the reference straight line is provided so as to be parallel to a straight line passing through centers of the plural spaces formed between the cylinder block and the cap.

10 8. The crankshaft bearing according to claim 1, wherein the reference straight line is provided so as to be inclined with respect to a straight line passing through centers of the plural spaces formed between the cylinder block and the cap.

15 9. The crankshaft bearing according to claim 1, wherein the crankshaft bearing is applied to one of a V-type engine with plural cylinders and an in-line engine with plural cylinders.

10. A bearing metal comprising:

an upper metal which is fitted to a first concave portion formed on a side opposite to a side where a cylinder head is provided in a cylinder block constituting an internal combustion engine; and

20 a lower metal which is fitted to a second concave portion formed in a cap that is provided on the side opposite to the side where the cylinder head is provided in the cylinder block, and which is combined with the upper metal so as to form the bearing metal,

25 wherein the bearing metal has a cross section in a substantially ring shape having an outer periphery and an inner periphery, and

wherein a thickness of each of the upper metal and the lower metal is formed such that a center of the inner periphery is deviated, while the upper metal and the lower metal are combined, with respect to a center of the outer periphery.

11. The bearing metal according to claim 10, wherein each of the outer periphery and the inner periphery has a perfect circular shape.